

## Wadi Halfa Oolitic Ironstone Formation, Wadi Halfa and Argein Areas, North Sudan

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**Abstract :** Recently a large deposit of oolitic iron ore of Late Carboniferous-Permian-Lower Jurassic age was discovered in Wadi Halfa and Argein areas, North Sudan. It seems that the iron ore mineralization exists in the west and east bank of the River Nile of the study area that are found on the Egyptian-Sudanese border. The Carboniferous-Lower Jurassic age strata were covered by 67 sections and each section has been examined and carefully described. The iron-ore in Wadi Halfa occurs as oolitic ironstone and contained two horizons: (A) horizon and (B) horizon. Only horizon (A) was observed in southern Argein area. The texture of the ore is variable depending on the volume of the component. In thin sections the average of the ooids were ranged between 90% - 80%. The matrix varies between 10%-20% by volume and detritus quartz in other component may reach up to 30% by volume in sandy massive ore. Ooids size ranges from 0.2mm-1.00 mm on average in very coarse ooids may attend up to 1 mm in size. The matrix around the ooids is dominated by iron hydroxide, carbonate, fine and amorphous silica. The probable ore reserve estimate of 1.234 billion at a head grade of 41.29% Fe for the Wadi Halfa Oolitic Ironstone Formation. The iron ore shows higher content of phosphorus ranges from 6.15% to 0.16%, with mean 1.45%. The new technology Hatch-Ironstone Chloride Segregation (HICS) can be used to produce commercial-quality of iron and reduce phosphorus and silica to acceptable levels for steel industry. The development of infra structures and presence huge quantity of iron ore would make exploitation of the iron ore economic.

**Keywords :** HICS, Late Carboniferous age, oolitic iron ore, phosphorus

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